

§ 23.147

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exceeding the operational and structural limitations of the airplane, as follows:

(1) For single-engine and multiengine airplanes, without the use of the primary longitudinal control system.

(2) For multiengine airplanes—

(i) Without the use of the primary directional control; and

(ii) If a single failure of any one connecting or transmitting link would affect both the longitudinal and directional primary control system, without the primary longitudinal and directional control system.

[Doc. No. 26269, 58 FR 42157, Aug. 6, 1993; Amdt. 23-45, 58 FR 51970, Oct. 5, 1993, as amended by Amdt. 23-50, 61 FR 5188, Feb. 9, 1996]

§ 23.147 Directional and lateral control.

(a) For each multiengine airplane, it must be possible, while holding the wings level within five degrees, to make sudden changes in heading safely in both directions. This ability must be shown at $1.4 V_{S1}$ with heading changes up to 15 degrees, except that the heading change at which the rudder force corresponds to the limits specified in § 23.143 need not be exceeded, with the—

(1) Critical engine inoperative and its propeller in the minimum drag position;

(2) Remaining engines at maximum continuous power;

(3) Landing gear—

(i) Retracted; and

(ii) Extended; and

(4) Flaps retracted.

(b) For each multiengine airplane, it must be possible to regain full control of the airplane without exceeding a bank angle of 45 degrees, reaching a dangerous attitude or encountering dangerous characteristics, in the event of a sudden and complete failure of the critical engine, making allowance for a delay of two seconds in the initiation of recovery action appropriate to the situation, with the airplane initially in trim, in the following condition:

(1) Maximum continuous power on each engine;

(2) The wing flaps retracted;

(3) The landing gear retracted;

(4) A speed equal to that at which compliance with § 23.69(a) has been shown; and

(5) All propeller controls in the position at which compliance with § 23.69(a) has been shown.

(c) For all airplanes, it must be shown that the airplane is safely controllable without the use of the primary lateral control system in any all-engine configuration(s) and at any speed or altitude within the approved operating envelope. It must also be shown that the airplane's flight characteristics are not impaired below a level needed to permit continued safe flight and the ability to maintain attitudes suitable for a controlled landing without exceeding the operational and structural limitations of the airplane. If a single failure of any one connecting or transmitting link in the lateral control system would also cause the loss of additional control system(s), compliance with the above requirement must be shown with those additional systems also assumed to be inoperative.

[Doc. No. 27807, 61 FR 5188, Feb. 9, 1996]

§ 23.149 Minimum control speed.

(a) V_{MC} is the calibrated airspeed at which, when the critical engine is suddenly made inoperative, it is possible to maintain control of the airplane with that engine still inoperative, and thereafter maintain straight flight at the same speed with an angle of bank of not more than 5 degrees. The method used to simulate critical engine failure must represent the most critical mode of powerplant failure expected in service with respect to controllability.

(b) V_{MC} for takeoff must not exceed $1.2 V_{S1}$, where V_{S1} is determined at the maximum takeoff weight. V_{MC} must be determined with the most unfavorable weight and center of gravity position and with the airplane airborne and the ground effect negligible, for the takeoff configuration(s) with—

(1) Maximum available takeoff power initially on each engine;

(2) The airplane trimmed for takeoff;

(3) Flaps in the takeoff position(s);

(4) Landing gear retracted; and

(5) All propeller controls in the recommended takeoff position throughout.